DNV·GL

Certificate No:
TAK0000145

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Pipes, Fibre Reinforced Thermosetting

with type designation(s)
JM180/JM260, JM180(C)/JM260(C)

Issued to
Suzhou Jiu Mei Fiberglass Limited Company
Suzhou, China

is found to comply with
DNV GL rules for classification – Ships
DNV GL class programme DNVGL-CP-0070 – Type approval – Fibre reinforced thermosetting plastic piping systems

Application :

Product approved by this certificate is accepted for installation on all vessels classed by DNV GL.

Issued at **Hamburg** on **2018-02-02**
This Certificate is valid until **2023-02-01**.
DNV GL local station: **Shanghai**

Approval Engineer: **Hagen Markus**

for **DNV GL**

Olaf Drews
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Product description

Filament Wound Fibre Reinforced Thermosetting Epoxy Resin Pipe and Fittings (GRE), Conductive and Non-Conductive.

Design Types

JM180/180C PN10, Collapse resistant up to 2.33bar (DN700) outside pressure, safety factor 3:1

JM260/260C PN16, Collapse resistant up to 4bar (DN900) outside pressure, safety factor 3:1

Note

JM180C/JM260C Epoxy system conductive.

Thickness of liner

Pipe inner diameter (mm)	Lining thickness (mm)
25-100	1.5
150-300	2.0
350-500	2.5
550-900	3.0

Size and pressure range

Design types	**Inner diameter range (mm)**	**Nominal Pressure PN**
JM180/JM180C	50 – 700	PN10
JM260/JM260C	25 – 900	PN16

Pipes -Structural wall thickness in mm

(excl. internal liner 1.5, 2.0, 2.5, 3.0 and top coat 0.5 – 0.8)

Inner diameter mm	**JM 180/180C PN10**	**JM260/260C PN16**
25	--	4.2
40	--	5.0
50, 65, 80, 100	5.0	5.0
125	--	5.5
150	5.7	6.0
200	6.4	7.6
250	7.7	9.2
300	8.4	10.0
350	9.6	11.0, 11.6*
400	10.8	12.5, 13.0*
450	12.2	13.8, 14.5*
500	13.5	15.0, 15.5*
550	--	16.0, 16.5*
600	16.2	18.0, 18.5*
650	--	18.0, 18.5*
700	19.0	20.8, 21.0*
750	--	21.6, 23.0*
800	--	23.0, 23.5*
900	--	26.0, 27.0*

Note

Dimension conform to Iron Pipe Size (IPS) outside diameters in 25 – through 900-mm sizes and *Marine Cast Iron (MCI) outside diameters in 350 through 900 mm sizes.

Standard fittings and joints

Elbows 45° and 90°, tees, saddles, reducers, flanges, double O-ring Bell&Spigott

Additional fittings may be used by following the minimum structural wall thicknisses as specified for the standard fittings.

Joining methods
- Adhesive bonding joint
- Bell and spigot and straight joint with double O-ring sealing
- Flanged

Application/Limitation

The JM-180/260 including C type piping system is type approved for application in piping systems as listed in
"Table 1- Fire endurance requirements matrix" of DNVGL Rules Pt.4, Ch.6, Section 2.
Approved installation locations are where "0" or "L3" is specified.
Appropriate footnotes are to be observed.

Maximum service media operating pressure[1]

Temperature [°C]	JM180 PN10	JM260 PN16
from -50 up to 60	10	16
up to 70	9.5	15
up to 80	8.5	13.5
up to 90	7	11
Up to 95	6	9.5

Notes
[1] Reduction of external pressure for service temperature above 50°C are to be calculated analogue to the values for reduction of internal pressure.

Extent of Type Tests applicable to piping system dependent on application
Fire endurance Level
Fire Endurance Level 3 according to IMO Resolution A.753 (18), Appendix 2 includes the following sizes and pipe connections.

Type of connection	Size range DN
Adhesive bonding joint	>152 up to 900

Flame spread
Surface flame spread characteristics tested acc. to standard IMO A.653(16).

Smoke and toxicity
Smoke and toxicity characteristics tested acc. to standard FTP Code Annex 1, Part 2.

Electrical conductivity
The JM180/260 piping syystem is limited for installation in non-gas hazardous areas
For installation in gas-hazardous areas system type JM180(C)/260(C) conductive piping system shall is approved.
Electrical conductivity test according to manufacturer instruction is to be carried out after installation of piping system on board ship.

Passenger vessels
For application on passenger vessels additional requirements specified in the Rules and Regulations of the appropriate flag state authority may have to be observed.

Design and Installation of piping systems
For the design and installation of piping systems the following Suzhou Jiu Mei Fiberglass documents are to be observed:

JiuMei GRE Piping System Installation Instruction
Technical Manual, 2017

In addition, the installation requirements specific to the ship as well as specified by the IMO 753-(18) are to be observed.

Bulkhead penetration
In case of plastic pipes pass through watertight bulkheads or decks, the watertight integrity of the bulkhead or deck is to be maintained by selection of GRE pipes with appropriate external pressure strength, i.e. JM180 or JM260.

When a plastic pipe penetrates a bulkhead or deck which is also a fire division and a fire may cause flooding of watertight compartments, a metallic shut-off valve shall be fitted at the bulkhead or deck. The operation of this valve shall be provided for from above the freeboard deck.
Refer to Pt.4,Ch.6 – Section 3.

On passenger vessels, where the watertight bulkhead is also a fire division, the requirements of the SOLAS Chapter II - 1, Regulation 13.2.3. are to be observed.

Type Approval documentation

Type Tests carried out

Production Testing
Each batch shall be subjected to product tests according to Suzhou Jiu Mei Fiberglass Instruction for Quality Control (page 25 of document " Documentation of Type Type Approval Test", 2017-06).

Marking of product
To ensure traceabilty from the final product to this type approval certificate each pipe or pipe spool is to be marked at least with:

		Example
Scope		JM(C)260EP6BAR0.3MPAFL400T10020170205
Manufacturer's name and / or logo		JM
Type designation / material of which the pipe or fitting is made		260 / EP
Size / dimensions		400
Type of joining method		FL=Flanged, AD=Adhesive bonded, EX=Expansion Joint
Design pressure	internal	NP9.5
	external	EP1 (3bar collapse pressure)
Temperature rating		
Service		95°C
Ambient		55°C
Conductive		(C)

Date of fabrication and / or serial number	10020170205 01-A-01 (01- production line, A-machine no., 01-piece no.)

Labels with the following text shall be attached to flanges which shall be joined by bolting:
"APPLY BOLTING TORQUE ACCORDING TO MANUFACTURER'S RECOMMENDATION".

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.
The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:
- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE